

## Section 23–3 Stems (pages 589–594)



### Key Concepts

- What are the three main functions of stems?
- How do monocot and dicot systems differ?
- How do primary growth and secondary growth occur in stems?

### Stem Structure and Function (page 589)

- What are the two important functions of stems?
  - \_\_\_\_\_
  - \_\_\_\_\_
- What three tissue systems compose a stem? \_\_\_\_\_  
\_\_\_\_\_

Match the stem structure with its description.

|       | Structure    | Description  |
|-------|--------------|--|
| _____ | 3. Node      | a. A region between nodes  |
| _____ | 4. Internode | b. Contains undeveloped tissue that can produce new stems and leaves |
| _____ | 5. Bud       | c. Where leaves are attached   |

### Monocot and Dicot Stems (page 590)

- How does the arrangement of tissues in a stem differ among seed plants?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- In a monocot stem, what does each vascular bundle contain? \_\_\_\_\_  
\_\_\_\_\_
- The parenchyma cells inside the ring of vascular tissue in a dicot stem are known as \_\_\_\_\_.
- What do the parenchyma cells outside the ring of vascular tissue form in a dicot stem?  
\_\_\_\_\_

### Primary Growth of Stems (page 590)

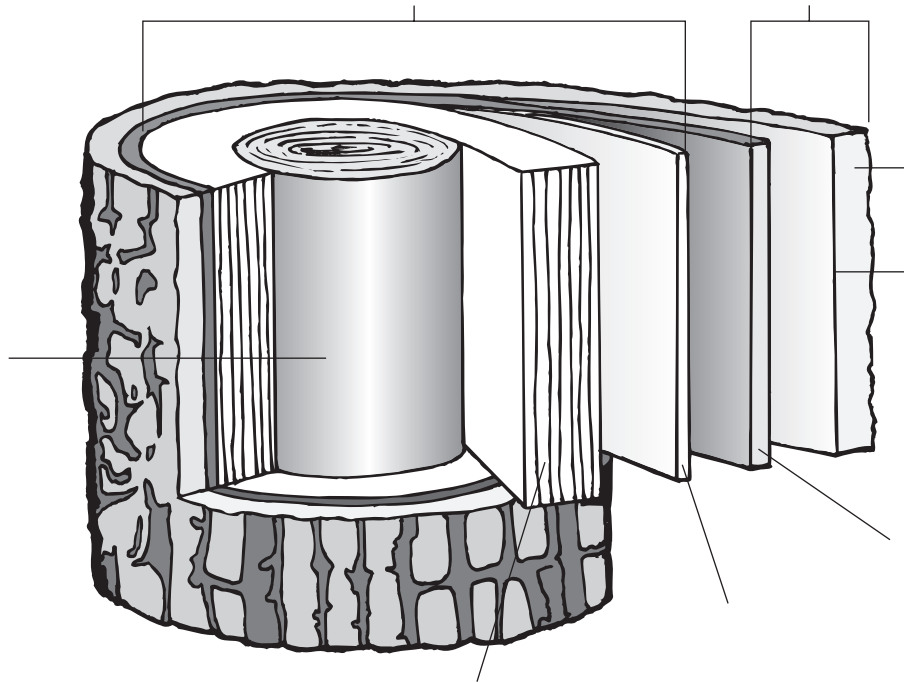
- What is primary growth in a plant? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. Primary growth of stems is produced by cell division in the \_\_\_\_\_.
12. Is the following sentence true or false? Only dicot plants undergo primary growth.
- \_\_\_\_\_

## **Secondary Growth of Stems (pages 591–594)**

13. The pattern of growth in which stems increase in width is called \_\_\_\_\_.
14. In conifers and dicots, where does secondary growth take place? \_\_\_\_\_
- \_\_\_\_\_
15. What type of lateral meristematic tissue produces vascular tissues and increases the thickness of stems over time? \_\_\_\_\_
16. What does cork cambium produce? \_\_\_\_\_
17. Circle the letter of each sentence that is true about the formation of vascular cambium.
- a. Vascular cambium forms between the xylem and phloem of individual vascular bundles.
  - b. Divisions of vascular cambium give rise to new layers of xylem and phloem.
  - c. Once secondary growth begins, vascular cambium appears as a thin layer.
  - d. The production of new layers of xylem and phloem causes the stem to shrink when secondary growth begins.
18. Is the following sentence true or false? Most of what we call “wood” is actually layers of phloem. \_\_\_\_\_
19. What is heartwood? \_\_\_\_\_
- \_\_\_\_\_
20. The wood that is active in fluid transport and therefore lighter in color is called \_\_\_\_\_.
21. The alternation of dark and light wood produces what we commonly call \_\_\_\_\_.
22. How can you estimate the age of a tree? \_\_\_\_\_
- \_\_\_\_\_
23. On most trees, what does bark include? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

24. Circle the letter of each sentence that is true about cork.
- Cork cells usually contain fats, oils, or waxes.
  - Cork cells cause the loss of water from a stem.
  - The outermost cork cells are usually dead.
  - Cork cambium produces a thick, protective layer of cork.
25. Label the parts of the illustration of the cross section of a tree. Use the following terms : wood, bark, heartwood, cork, sapwood, cork cambium, vascular cambium, phloem.



26. What are four kinds of modified stems that store food?
- \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_